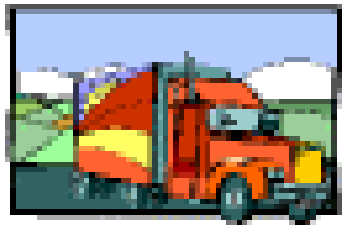

USING WEIGH-IN-MOTION DATA IN A MODERN TRUCK TRAFFIC INFORMATION SYSTEM

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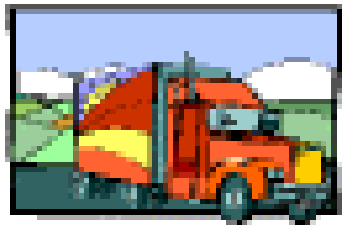
Jeannette Montufar, P.Eng.

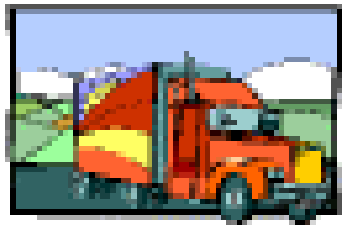
Dan Middleton, P.E.

University of Manitoba Transport Information Group



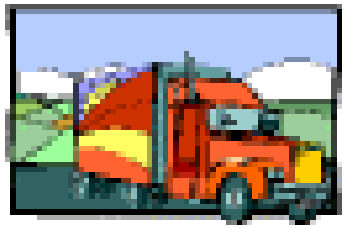
INTRODUCTION

- demand for enhanced truck traffic information systems
  - transportation planning
  - highway design
  - safety analysis
  - environmental assessment
  - economic evaluation
  - asset management
  - enforcement
- the new Traffic Monitoring Guide and AASHTO Pavement Design Guide

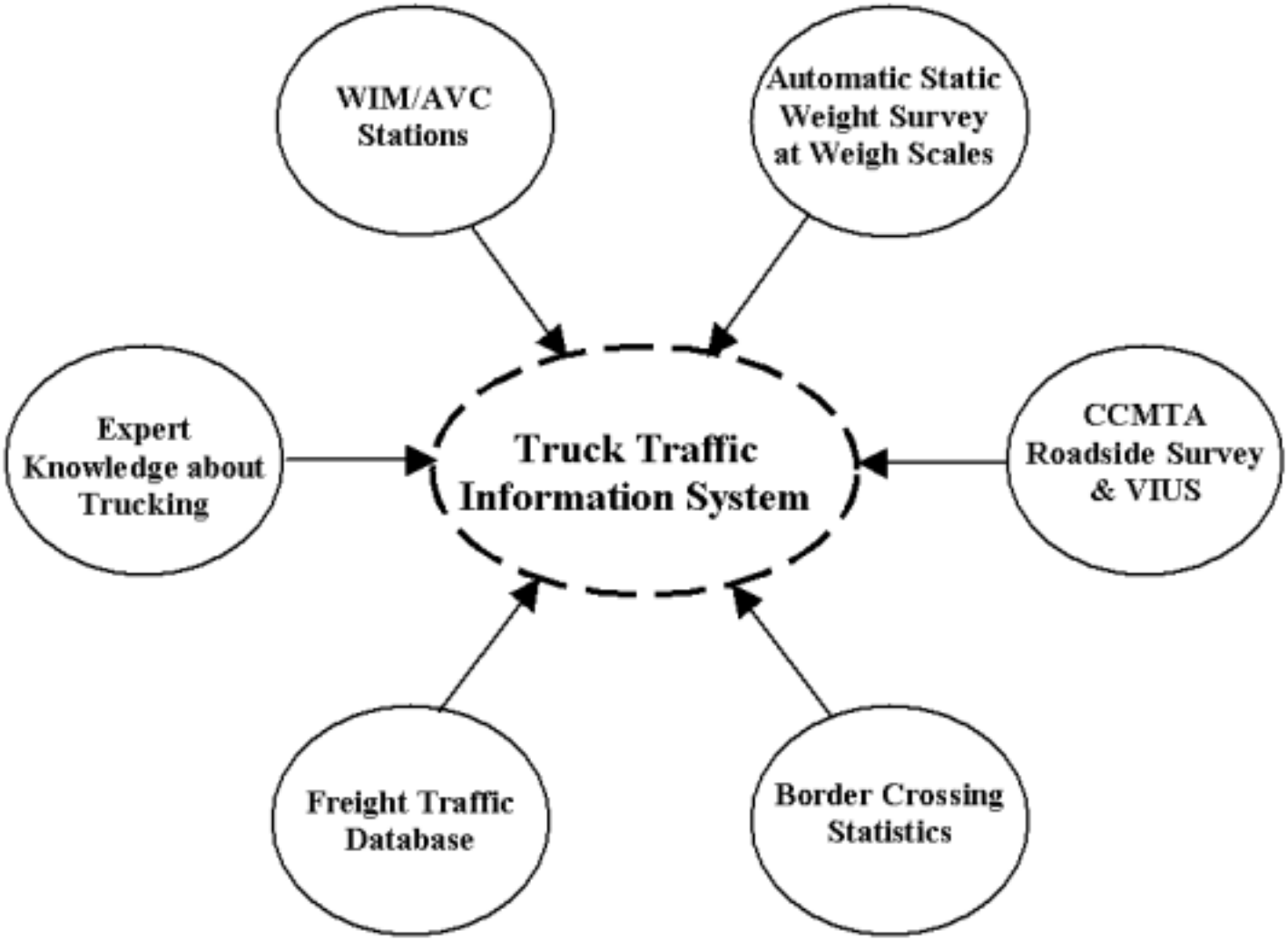


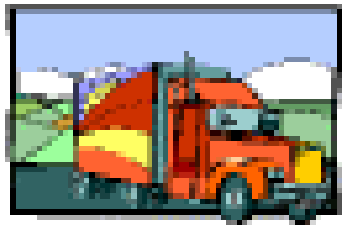
BACKGROUND

- Manitoba Transportation and Government Services (MTGS) commissioned UMTIG to create a truck traffic information system
- truck traffic volumes and characteristics govern:
  - highway planning and programming
  - traffic engineering
  - road use management
  - design and evaluation of weight and safety enforcement activities
  - bridge design and management



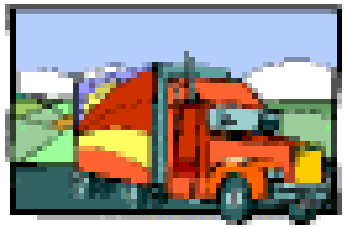
MANITOBA TRUCK TRAFFIC INFORMATION SYSTEM





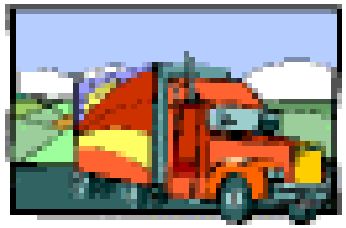
PURPOSE

- gain an ever increasing understanding of truck traffic, improved accuracy and forecasting abilities
- the ultimate goal is production of realistic and accurate truck loading values for each season, for each highway weight class throughout the province



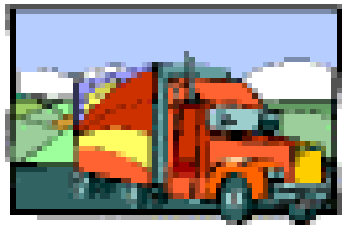
SYSTEM REQUIREMENTS

- 8 research and development projects facilitating achievement of this goal involve the development of
  - core database for truck traffic
  - technique for converting short-term counts
  - assignment of each highway link to a TTPG
  - AADTT flow map
  - method and database for axle weight estimation
  - estimates of current year truck loading for each link
  - technique for future truck traffic forecasting
  - truck monitoring/analysis system to be used by department



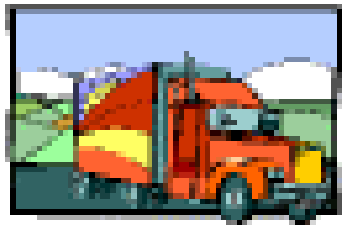
DEVELOPMENT, EXPERIENCES AND APPLICATIONS

- development and implementation of truck traffic information system focused on:
  - design, installation and operation of an expanded WIM/AVC network
  - analysis of classification and temporal distribution of data generated by WIM/AVC network
  - design and installation of automated truck weight survey system, and analysis of survey results
  - GIS-T platform servicing truck traffic information system
  - updated analysis of selected freight databases

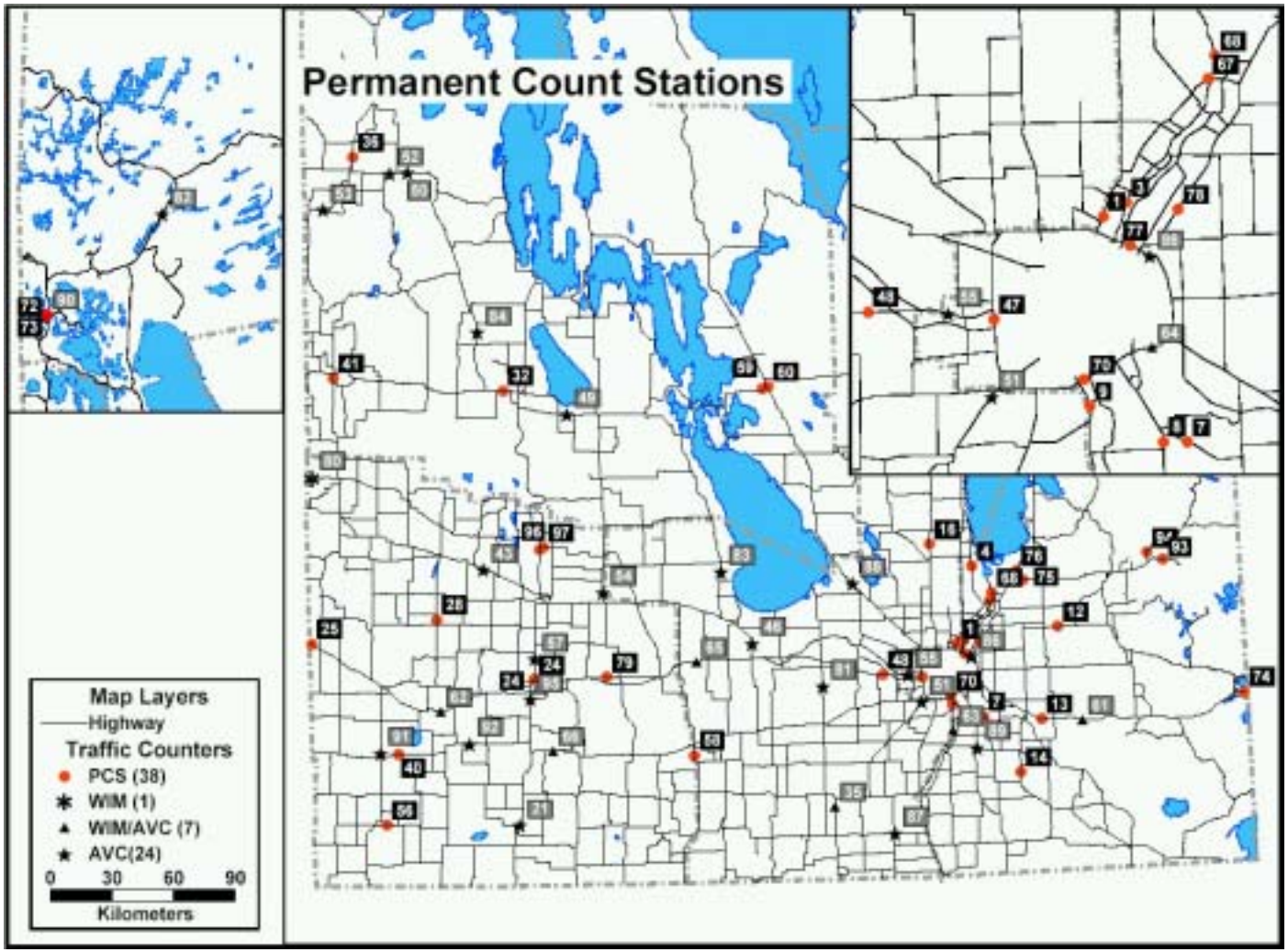


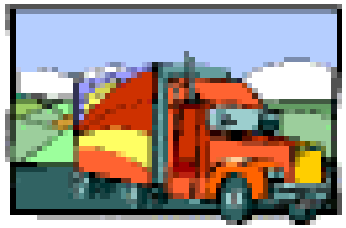
MANITOBA WIM/AVC NETWORK

- considerations in designing the network:
  - areas lacking historical truck traffic monitoring
  - changes in road network altering truck routing
  - changes in trucking demand
  - changes in trade arrangements
  - changes in truck size and weight regulation
- physical placement of WIM/AVC device is based on:
  - availability of communication system
  - adequacy of pavement structures
  - accessibility of sites to adequate maintenance



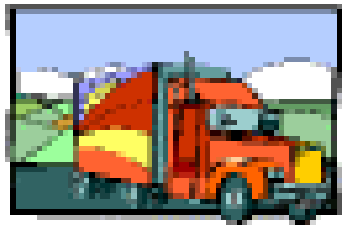
MANITOBA WIM/AVC NETWORK





TRUCK CLASSIFICATION AND TEMPORAL DISTRIBUTIONS

- based on WIM/AVC data
- Manitoba uses FHWA 13-class scheme
- classes 1-4 are “non-trucks”
- classes 5-13 are trucks
- truck traffic data, for each station, is summarized on a “truck traffic fact sheet”



TRUCK CLASSIFICATION AND TEMPORAL DISTRIBUTIONS

TRUCK TRAFFIC FACT SHEET

Station Number: 86

Location: PTH 101, 1.0 km E of Wurtel Road

Year of Installation: 1997 , converted to Diamond in 1999

Load Classification: RTAC

Functional Classification: Expressway

AADT:

Percent Trucks: 21%

AADTT:

AADTT Eastbound Traffic:

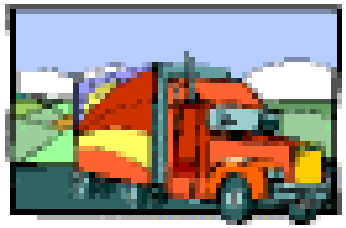
AADTT Westbound Traffic:

Classification Considerations:

Eastbound Traffic

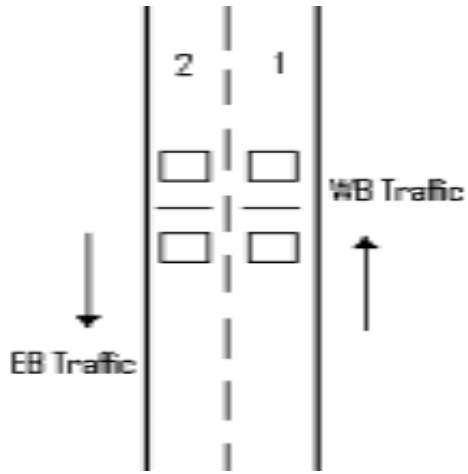
Westbound Traffic

Comments:



STATION 86

Location: HWY 101, 1.0 km E of Wenzel Road

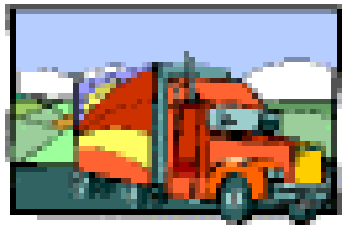


Load Class : RTAC

Functional Class : Undivided Arterial

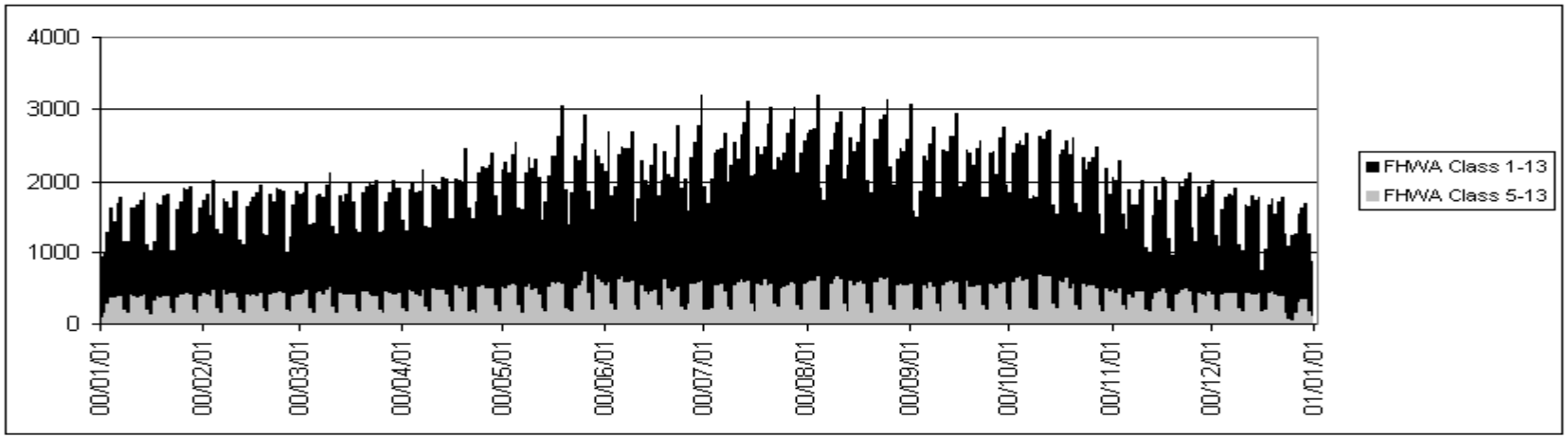
Year of Installation: 1997 as Golden River, converted to Diamond AVC in 1999

Type of Equipment: PHOENIX permanent AVC

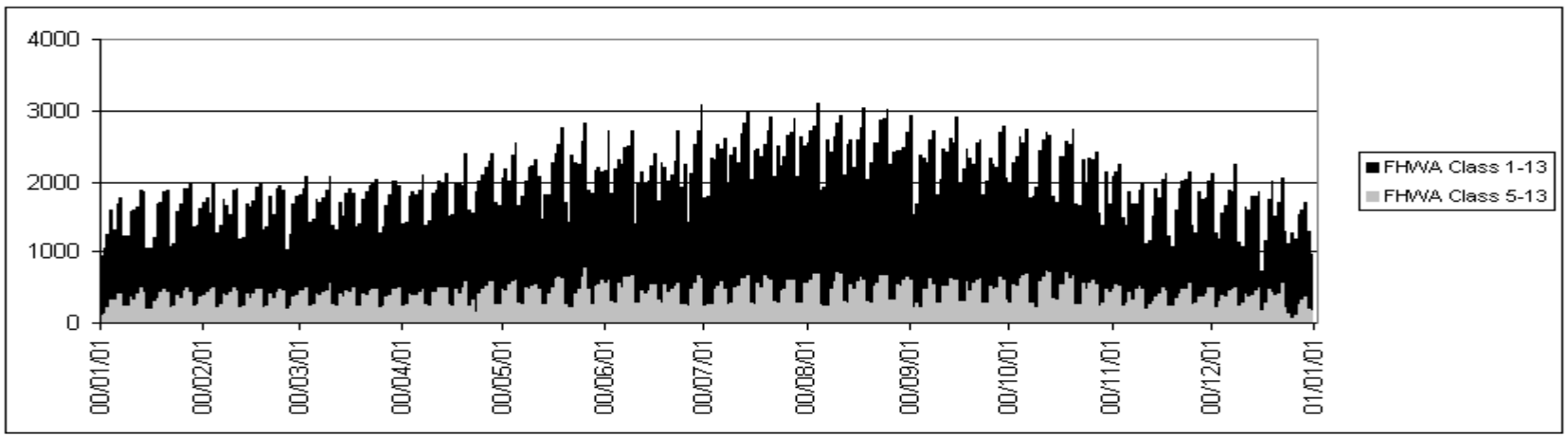


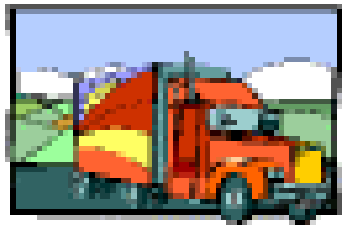
STATION 86

Eastbound



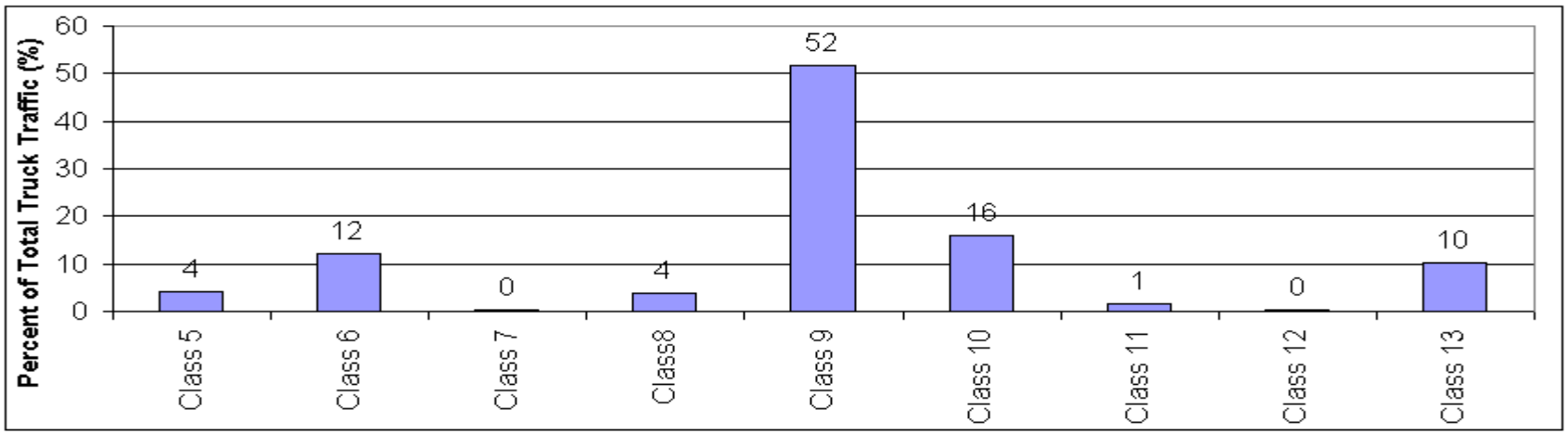
Westbound





STATION 86

Eastbound



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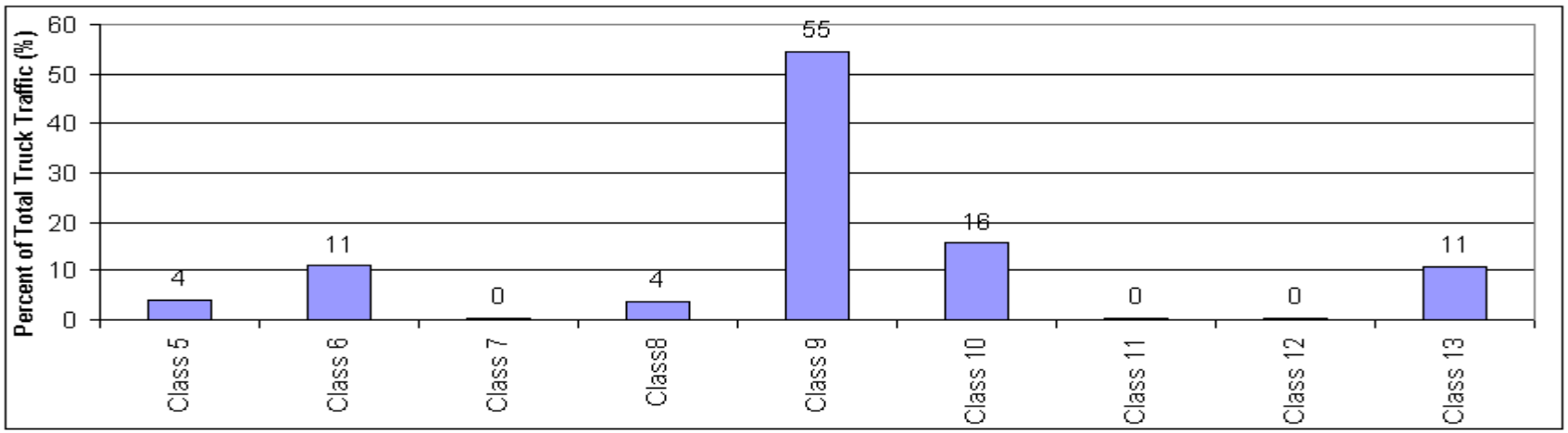
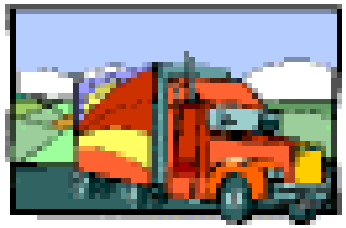
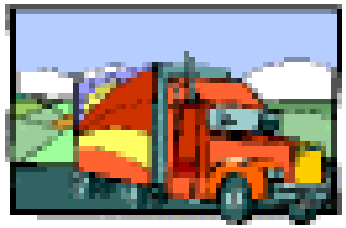




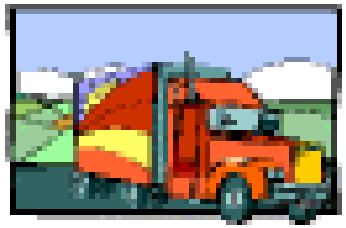
AUTOMATED TRUCK WEIGHT DATA COLLECTION SYSTEM AT WEIGH SCALES

- two principal data source from truck weight perspective are:
  - automated, year-round sampling of static truck weights
  - truck weight sampling from properly calibrated WIM devices

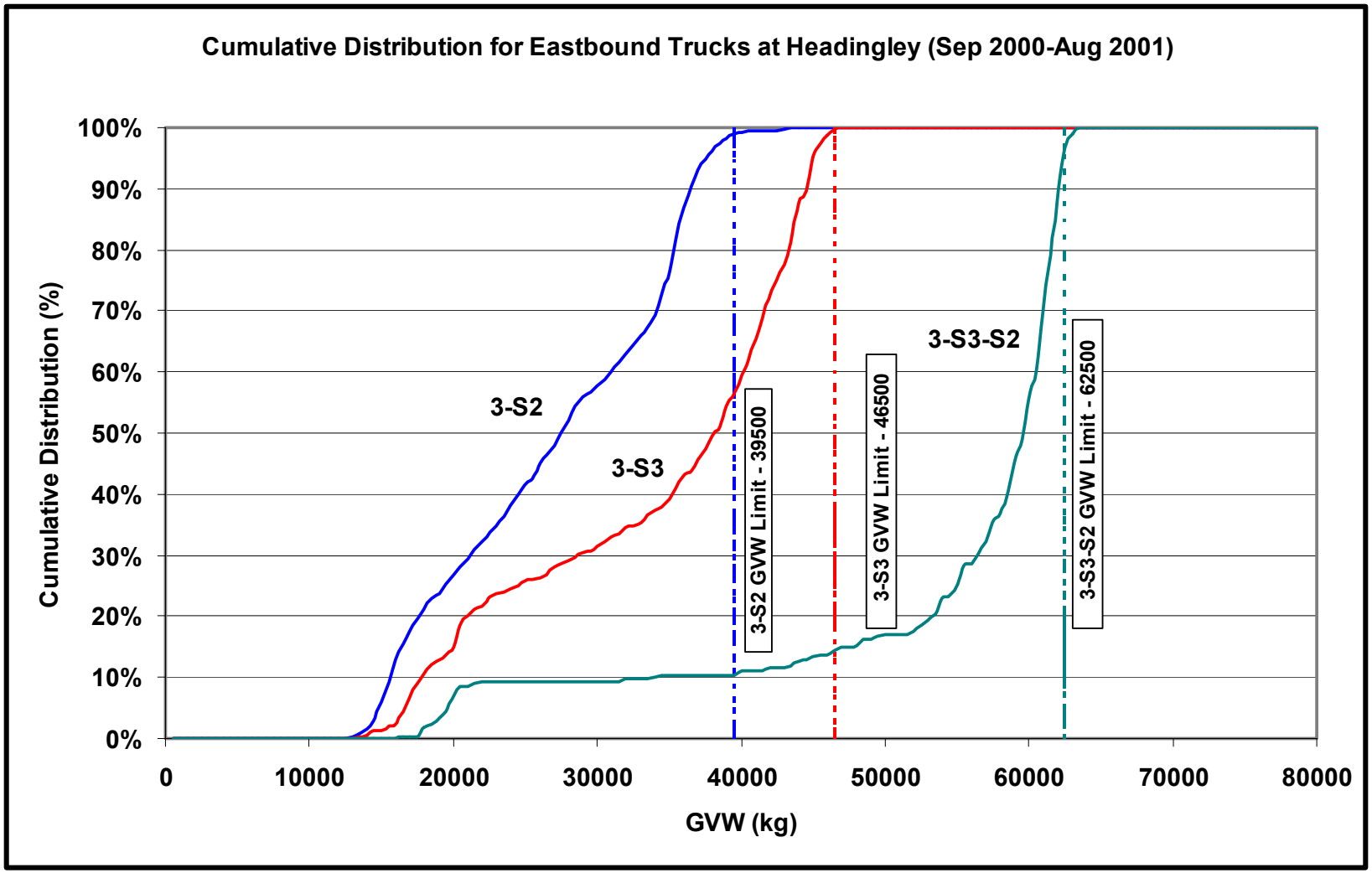


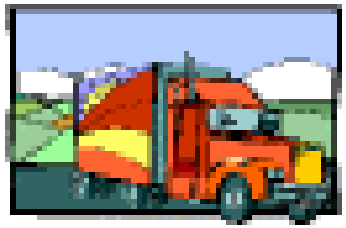
SURVEY REQUIREMENTS

- 1% sample of all truck movements is collected randomly by:
  - time of day
  - day of week
  - month of year
- basic requirements are:
  - configuration selections
  - axle configurations
  - body type
  - static weight of each axle



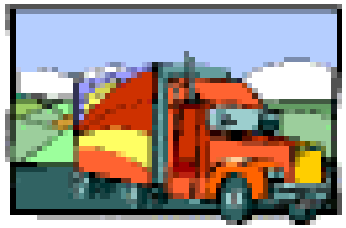
EXAMPLE OF GVW DISTRIBUTIONS





GIS-T PLATFORM

- develops standardized information database to:
  - visually represent truck traffic information
  - integrate truck traffic related data
  - conduct spatial and network analysis on the data set
- provides a user friendly interface to the truck traffic information system
- structured around three major transportation components:
  - transportation facilities (T)
  - activity system (S)
  - transportation flow (F)



CONCLUDING REMARKS

- Manitoba's truck traffic information system is an emerging concept that can facilitate decision-making
- WIM/AVC devices provide tremendous amount of useful data about trucking
- Making informed decisions requires continual updates to understand the transportation system
- Understanding requires being able to interpret the information
- Information is data with meaning and context added